Growing Millet in Montana

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Acreage of several millet species has increased in recent years. Millet is a short-term warm-season annual crop that has excellent drought hardiness. Millet grain is used for human food products, livestock feed or birdseed. Several millets can produce good forage yields, and are useful for emergency forage or a catch crop after hailed-out wheat. As warm-season species, millets are sensitive to late spring frosts, so they should be seeded after soil temperatures are consistently above 65 degrees. For emergency forage during a drought, millets can out-yield sudangrass or sorghums. However with good moisture or under irrigation, other warm-season forages (sudangrass, sorghum, sorghum X sudangrass hybrids or corn) are superior.

The primary types of millet are:

1) **Proso millet** (*Panicum miliaceum*) is used primarily for birdseed or livestock feed. Proso millet grows to about a 30-inch height, and the stems are hollow and coarse. The leaves and stems are pubescent, and the seed heads (panicles) are large and lax. When the seed is threshed, most of the inner hulls remain attached to the grain. Seed color varies among varieties, from white, cream, red to brown or black. For birdseed production, white grain is preferred, so be sure to contact a marketer before planting. There are about 80,000 seeds per pound. Seeding rates of 15 to 30 pounds of pure live seed per acre are recommended, but due to poor seedling vigor, higher seeding rates (>25) have been successful. If grown in wide rows (>24-inch) as a row crop for grain, seeding rates of 5 pounds are adequate. Plant at 0.5 to 0.75-inch depth into a firm seedbed. Depending on variety and growing season, proso millet requires 70 to 100 days to mature grain. Grain harvest of proso millet is accomplished by swathing when the top half of the panicles have mature seed (seed in lower half will be in the dough stage), followed by combining. Some varieties of proso millet are: Abarr, Cerise, Cope, Dawn, Leonard, Minco, Minsum, Rise, Turghai and "Common".
2) **Foxtail millet** *(Setaria italica)* or Siberian millet is used primarily as a forage crop. Forage varieties can be over 40 inches in height, and can be cut 75 to 90 days after seeding. Foxtail millet stems are slender and leafy, and the heads are dense and bristly. Seed colors vary from white, yellow, orange, green and purple. Foxtail millet has about 220,000 seeds per pound, so recommended seeding rates are 4 to 12 pounds of pure live seed per acre, seeded at 0.5 to 0.75-inch depth. Due to its shallow root system, foxtail millet is a poor pasture crop – it should be hayed or windrow-grazed. For optimum quality, foxtail millet should be cut for hay in the late boot to early bloom stage. Delayed harvest can the result in lump jaw or eye injury of livestock from the bristly heads. Depending on conditions, hay harvest in Montana might coincide with frost. It is recommended that hay millet be checked for nitrate accumulation prior to feeding. Additionally, over-mature foxtail millet hay can act as a diuretic to horses if it is the sole roughage source. Varieties of foxtail millet are: Butte, German, Golden German, Manta, Sno-Fox, White Wonder and "Common".
3) **Pearl millet** *(Pennisetum americanum)* is grown primarily for grain production in warmer areas, but can be used as forage, depending on variety. Most varieties or hybrids mature require 120 days to maturity, so these are not suitable for grain production in Montana. In Colorado, forage types of Pearl millet can reach 8 to 10-foot heights. For hay production, seeding rates from 10 to 20 pounds per acre are recommended.
4) **Japanese millet** *(Echinochloa crusgalli)* is grown primarily for forage in warmer areas.

Very little research has been conducted with millet in Montana. In early trials, forage yields of other crops were superior to millet on crop-fallow (Table 1). In recent trials, millet has been tested on both fallow and re-crop. Because millet is mostly grown as an emergency forage during drought, performance on re-crop is a better indication of the potential of millet forage. In 1998, six millet varieties were tested for forage production at Moccasin (Table 2). In this trial, the two foxtail millets produced over two tons per acre, but the proso millet varieties had acceptable forage yields. The millet forage had fair levels of protein, but levels of acid detergent fiber (ADF) were very low – indicating excellent potential forage digestibility and

energy levels. Forage nitrate concentrations were well below cautionary levels for feeding. Although no livestock feeding trails were conducted, these data indicate that these millets would be acceptable roughages in Montana. Grain yields ranged from 2 to 1200 pounds per acre. The pearl millet entry in this trial had poor forage and grain production.

Table 1. Average dryland millet forage yields (dry pounds per acre) on crop-fallow in Montana.

	1927-1932	1970	1971
Millet (white)	1798	1954	1990
Corn, 85-day	-	-	2194
Corn, >90-day	3223	1850	2552
Oat	2265	-	-
Sorghum	3073	-	-
Sorghum x sudangrass		-	1153
Sudangrass	1925	-	-

Table 2. Millet variety trial at Moccasin, Montana in 1998. The trial was seeded May 20, forage yields on August 26 and grain harvest on September 17 (yields averaged across fallow and re-crop).

			Forage Quality (dry matter basis)			
Species	Variety	Dry Forage (lb/A)	% Protein	% ADF	% NDF	Grain Yield (lb/A)
Proso	common	3612	13.7	22.8	48.7	752
Proso (red)	Cerise	3437	11.7	21.0	44.2	1001
Proso (white)	Common	3661	11.2	19.0	41.3	1197
Foxtail	Golden German	4039	8.3	26.2	51.3	126
Foxtail	Common Siberian	4298	11.06	23.0	46.6	1080
Pearl	Common	910	10.6	22.0	48.6	2